

Introduction -

Definitions

Nudge: an intervention that facilitates actions by minimizing decision friction Sludge: an intervention that deters actions by increasing decision friction

Past frameworks

MINDSPACE framework (Dolan et al., 2012), System 1 & System 2 (Kahneman, 2011; Sunstein, 2016), EAST framework (Service et al., 2014), SHIFT framework (White et al., 2019)

Limitations of past frameworks

Focused on application (e.g., how to deliver nudge intervention)

- The underlying psychological mechanisms are still unclear
- Limited systematic review of the effectiveness of nudge and sludge interventions

Cognitive framework-

How is each cognitive process used in nudges and sludges interventions?

Cognitive Processes	Definitions
Attention	Using bottom-up features (e.g., color, size) to increase or decrease the
Perception	Framing the content of information to influence the conscious interpret
Memory	Using encoding cues or retrieval cues to alter behaviors
Effort	Changing cognitive or physical ease associated with an option
Intrinsic Motivation	Influencing one's inherent interests toward an option in the absence of
Extrinsic Motivation	Imposing external rewards or punishments to alter behaviors

Cognitive framework of nudges and sludges

	Beneficia	l for people	Harmful	for
Cognitive	Nudge (decrease friction to	Sludge (increase friction to	Nudge (decrease friction to	Slu
Processes	faciliate change)	deter actions)	facilitate actions)	de
Attention	Colour	'Are you sure?' alert	Sensory cues in casino	Re im
Perception	Benefit framing	Cost framing	Bundle pricing (e.g., Netflix's movie bundles)	Pri sh
Memory	Reminder (e.g., promoting college enrollment)	Reminder (e.g., deterring from overconsumption)	Repetitive advertising	Ab en
Effort	Auto-enrollment plan	Inconvenience	Easy access to unhealthy food	Co pro
Intrinsic Motivation	Social norm (e.g., promoting donation)	Social norm (e.g., deterring overconsumption)	Junk food advertising	Va
Extrinsic Motivation	Small financial incentives	Small fees for no-shows	Micro-incentives to gamble	Me

A meta-analytic cognitive framework of nudge and sludge

Yu Luo¹, Andrew Li¹, Dilip Soman², & Jiaying Zhao¹

¹University of British Columbia, ²University of Toronto Paper available at: <u>https://psyarxiv.com/dbmu3/</u>









Effort-based interventions are the most effective, followed by attention-based interventions. Nudge and sludge had the same effect.

tion	Cognitive process	K(>5)	d [95% CI]
	Effort	13	0.73 [0.32, 1.13]
ting	Attention	7	0.57 [-0.22, 1.36]
oility	Effort	8	0.40 [0.18, 0.62]
ional messaging	Perception	10	0.38 [0.08, 0.69]
er	Memory	32	0.29 [0.13, 0.46]
ment making	Intrinsic	6	0.29 [-0.05, 0.63]
ming	Perception	11	0.28 [-0.03, 0.58]
I incentives	Extrinsic	13	0.28 [0.09, 0.47]
	Attention	9	0.20 [-0.04, 0.43]
	Memory	9	0.17 [-0.10, 0.44]
orm	Intrinsic	33	0.11 [0.04, 0.18]

Effort-decreasing interventions (e.g., default, accessibility) and Attention-grabbing interventions (e.g., highlighting) are the most effective.

Discussion

- Organizes nudge and sluge based on six cognitve processes governing decision making
- Allowed comparisons of effect sizes accross different interventions
- Allowed direct comparisons between nudge and sludge
- Offered a ranking of interventions based on effect sizes